ALMA/GSMT Meeting Summary

Dear Colleagues:

I have tried to capture the main points of our discussion in the bulletized summary below. PLEASE PROVIDE COMMENTS AND ADDITIONS over the next few days, and in any case prior to 03 Aug so that I can begin to take the next steps with the confidence that this summary indeed represents the group consensus.

- there was universal agreement that ALMA and GSMT enable powerful and complementary probes of astrophysical phenomena and events: from the origin and early evolutionary history of galaxies, to the formation of planets in accretion disks around young stars, to the final stages of stellar evolution.

  Details of the potential synergies are summarized in the meeting presentations which are now accessible through the AURA New Initiatives Office website

  http://www.aura-nio.noao.edu/presentations/alma-gsmt/alma-gsmt.html

- While the QUALITATIVE synergies between the two facilities is clear, QUANTITATIVE analysis of example problems are currently unavailable.

- Two steps are required in order to enable quantitative study:

  * creation and/or translations of existing models into O/IR and mm/submm observables for systems likely to be the target of major ALMA and GSMT programs. These would include circumstellar accretion and debris disks; extrasolar giant planets in various stages of evolution; pregalactic fragments; assembling galaxies; young assembled galaxies. At this stage, such models need to be PLAUSIBLE rather than detailed.

    The group consensus appeared to be that adequate MODELS might be available, but that translation into observables (surface brightnesses; line fluxes; etc...) is still needed.

  * creation of readily accessible tools for simulating observations of these target systems and calculating observing times.

- Following creation of models (and/or translation of existing models into observables), 'observing scenarios', outlining comprehensive ALMA/GSMT programs should be developed.

- To carry out the above will require support of several committed individuals or groups. It was proposed that NIO offer to fund studies/simulations leading to creation of input models and observing scenarios.

- Setting the 'statements of work' for such studies might be the first task for small, standing 'working groups'

large-scale structure and galaxy evolution

star and planet formation

STROM and WOOTTEN will work together to assemble candidate names for those working groups with a goal of circulating them to the ALMA/GSMT workshop participants for comment prior to 01 AUG.

- NIO will develop an 'exposure time calculator' to guide analysis of time requirements for O/IR observations.

  Q: will NRAO be able to provide a similar tool, or does one already exist?

- Owing to the potential synergies, the requirement of co-locating ALMA and NGST in the southern hemisphere becomes a potentially important issue.

  To understand QUANTITATIVELY whether co-location is required, we need to develop an understanding of the zenith-angle-dependent factors that can degrade ALMA and GSMT observations (AO/MCAO performance; atmospheric extinction, both broad-and narrow band; atmsopheric emissivity; mm-wave seeing; phasing issues.....)

  STROM took the action to work with Rigaut and Ellerbroek from NIO to develop a short paper summarizing the O/IR issues.

  WOOTTEN took the parallel action for ALMA

- The need for at least one, and possibly several technical working groups was identified.

  Specifically, registration of O/IR and mm-wave fields to a common astrometric coordinate group may be a real challenge, particularly given the ability to make 20mas images!

  Via this summary, I am asking whether Min Yun would be willing to work with me to assemble such a working group.

- Participants agreed that there would be significant value in a broader (60-80 participant) community workshop aimed at deeper exploration of GSMT synergies NOT ONLY WITH ALMA, but with other next generation facilities (e.g. SKA; NGST....).

  It was agreed that 'homework' prior to such a workshop would greatly enhance its value by enabling quantitative as well as qualitative discussions.

  STROM, working with NIO scientists, will take the action to recommend a meeting framework, to be vetted with the attendees at the 09 JUL Washington workshop.

Thank you all once again for taking the time to prepare focused and very useful remarks and to participate in what I thought was a lively and productive discussion. I look forward to working with you in the future.

Best

Steve Strom